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10/507,321

06/28/2005

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EXAMINER

ULLAH, ELIAS

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 10/507,321 | Applicant(s) FUJII ET AL. | |
| | Examiner ELIAS ULLAH | Art Unit 2892 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/14/2007, 7/18/2007, 7/24/2007, 8/23/2007,</u> | 6) <input type="checkbox"/> Other: _____. |
| <u>9/5/2007, 12/19/2007, 01/08/2008, 02/19/2008, 3/31/2008, 6/12/2008.</u> | |

DETAILED ACTION

This office action is in response to an election restriction filed on 5/20/2008.

Election/Restrictions

1. Applicant's election of claims 13-55 in the reply filed on 5/20/2008 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 13-15, 17, 24-28, 34-38, and 44-55, are rejected under 35 U.S.C. 102(e) as being anticipated by Sawada US 2002/0115235).

With regard to claims 13 and 24-28, 34-38, 44-47 Sawada shows a substrate dividing method (Figs. 12(A)-14(C) comprising the steps of irradiating a substrate (W, Fig. 12(A)) with laser light (L, Fig. 14(A) while positioning a light-converging point within the substrate (Fig. 14(A)), so as to form a modified region (G, Fig. 14(B)), and causing the modified region to form a starting point region for cutting along a line along which the substrate should be cut in the substrate (Fig. 14(C) inside by a predetermined

distance [0066] from a laser light incident face of the substrate; and grinding the substrate (Fig. 12(D)) after the step of forming the starting point region (G, Fig. 12(B)) for cutting such that the substrate attains a predetermined thickness (t2, Fig. 12(D)) and wherein the modified region is a molten processed region [0015], wherein the substrate surface formed with at least one semiconductor device [0010 and 0004].

The recitation of “modified region caused by photon absorption” within the semiconductor substrate and causing the modified region to form a part which is intended to be cut is only a statement of the inherent properties of the modified region. The irradiating laser and substrate recited in Sawada in [0060-0066] and [0071] is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

With regard to claim 14, Sawada shows wherein the substrate is a semiconductor substrate [0004].

With regard to claim 15, Sawada shows wherein the modified region is a molten processed region [0015].

With regard to claim 17, Sawada shows a front face of the substrate is formed with a functional device [0010 and 0004], and wherein a rear face of the substrate is ground in the step of grinding the substrate (Fig. 12(D)).

With regard to claims 48-55, Sawada shows the substrate is ground such that the modified region remains in the substrate in the step of grinding the substrate, and the substrate is ground such that at least a part of a fracture generated from the starting point region for cutting as a start point in the thickness direction of the substrate remains in the substrate and the modified region does not remain in the substrate in the step of grinding the substrate (Fig. 12(A))-Fig. 12(D)).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 19-22, 29-32, 39-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawada (US 2002/0115235 A1) in view of Piwczyk et al. (US 6,376,797).

With regard to claims 19- 22, 29-32, 39- 42, Sawada teaches a substrate dividing method (Figs. 12(A)-14(C) comprising the steps of irradiating a substrate (W, Fig. 12(A)) with laser light (L, Fig. 14(A) while positioning, and causing the modified region modify region including a crack region [0016] and molten process region [0015] within the substrate to form a starting point region for cutting along a line along which the substrate should be cut (Fig. 14(C) in the substrate inside by a predetermined distance [0066] from a laser light incident face of the substrate; and grinding the substrate (Fig. 12(D)) after the step of forming the starting point region (G, Fig. 12(B)) for cutting such that the substrate attains a predetermined thickness (t2, Fig. 12(D)) and a pulse width of 1 us or less [0069] and wherein the substrate surface formed with at least one semiconductor device [0010 and 0004].

The recitation of “modified region caused by photon absorption” and “ a modified region including a refractive index change region” within the semiconductor substrate and causing the modified region to form a part which is intended to be cut is only a statement of the inherent properties of the modified region. The irradiating laser and substrate recited in Sawada in [0060-0066] and [0071] is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

Sawada fails to disclose specifically a light-converging point within the substrate under a condition with “a peak power density of at least 1×10^8 (W/cm²) at the light-converging point”, so as to form a modified region including a crack region within the substrate.

However, Sawada discloses a general laser light to form a modified region [0060-0067]. An additional ref. is provided for supporting the facts “under a condition with a peak power density of at least 1×10^8 (W/cm²) at the light-converging point” (US Ref. US 6,376,797 in col. 3, lines 25-50 for mere facts). Accordingly, it would have been obvious to one of ordinary skill in art to use teaching Sawada in the range as claimed, because it has been held that where the general conditions of the claims are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation. MPEP 2144.05.

4. Claims 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawada in view of Yamada (US 4,899,126).

With regard to claim 16 and 18, Sawada fails to teach the substrate is an insulating substrate and grinding the substrate to “a chemical etch”.

Yamada teaches the substrate is an insulating substrate and grinding the substrate to “a chemical etch” (col. 1, lines 10-15). At the time the invention was made; it would have been obvious to a person having ordinary skill in the art to use an insulating substrate and grinding the substrate to “a chemical etch” teaching of Yamada in the method of cutting a substrate of Sawada, because using an insulating substrate

and an a chemical etching for substrate are conventional method in the art as taught by Yamada in (col. 1, lines 5-20).

5. Claims 23, 33, 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawada in view of Radojevic et al. (US 2003/0010275) and Piwczyk et al. (US 6,376,797).

With regard to claims 23, 33, 43, Sawada teaches a substrate dividing method (Figs. 12(A)-14(C) comprising the steps of irradiating a substrate (W, Fig. 12(A)) with laser light (L, Fig. 14(A) while positioning, and causing the modified region modify region including a crack region [0016] and molten process region [0015] within the substrate to form a starting point region for cutting along a line along which the substrate should be cut (Fig. 14(C) in the substrate inside by a predetermined distance [0066] from a laser light incident face of the substrate; and grinding the substrate (Fig. 12(D)) after the step of forming the starting point region (G, Fig. 12(B)) for cutting such that the substrate attains a predetermined thickness (t_2 , Fig. 12(D)) and a pulse width of 1 μ s or less [0069] and wherein the substrate surface formed with at least one semiconductor device [0010 and 0004].

The recitation of “modified region caused by photon absorption” and “ a modified region including a refractive index change region” within the semiconductor substrate and causing the modified region to form a part which is intended to be cut is only a statement of the inherent properties of the modified region. The irradiating laser and substrate recited in Sawada in [0060-0066] and [0071] is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the

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claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

Sawada fails to disclose specifically a light-converging point within the substrate under a condition with “a peak power density of at least 1×10^8 (W/cm²) at the light-converging point”, so as to form a modified region including a crack region within the substrate.

However, Sawada discloses a general laser light to form a modified region [0060-0067]. An additional ref. is provided for supporting the facts “under a condition with a peak power density of at least 1×10^8 (W/cm²) at the light-converging point” (US Ref. US 6,376,797 in col. 3, lines 25-50 for mere facts). Accordingly, it would have been obvious to one of ordinary skill in the art to use the teaching of Sawada in the range as claimed, because it has been held that where the general conditions of the claims are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation. MPEP 2144.05.

Sawada also fails to disclose the substrate is made of a piezoelectric material.

Radojevic et al. teaches the substrate is made of a piezoelectric material [0077]. At the time the invention was made; it would have been obvious to a person having ordinary skill in the art to use a substrate made of piezoelectric material teaching of Radojevic et al. in the method of cutting a substrate of Sawada, because using an a

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substrate made of piezoelectric material able to bond with thin layer over substrate that will help to improve manufacture a packaging die as taught by Radojevic et al [0077].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELIAS ULLAH whose telephone number is (571)272-1415. The examiner can normally be reached on weekdays, between 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thao Le can be reached on (571) 272-1708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Elias Ullah/
Examiner, Art Unit 2892

/Lex Malsawma/
Primary Examiner, Art Unit 2892